

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claims 1-2 (Canceled)

3. (Currently Amended) A motion control apparatus for a vehicle comprising:

vehicle-body speed obtaining means for obtaining a vehicle-body speed of the vehicle;

steering-member operating amount obtaining means for obtaining an operating amount of a steering member of the vehicle which changes a steering angle of steerable wheels of the vehicle;

actual lateral acceleration related quantity obtaining means for obtaining, as an actual lateral acceleration related quantity, an actual value of a lateral acceleration related quantity indicating the extent of turning of the vehicle;

target lateral acceleration related quantity calculating means for calculating a target lateral acceleration related quantity which is a target value of the lateral acceleration related quantity in accordance with the vehicle-body speed, in such a manner that

when the vehicle-body speed is at least a prescribed value, the absolute value of the target lateral acceleration related quantity is equal to or less than the absolute value of a reference lateral acceleration related quantity which is a reference value of

the lateral acceleration related quantity determined by a prescribed rule based on at least the vehicle-body speed and the steering-member operating amount and

when the vehicle-body speed is less than the prescribed value, the absolute value of the target lateral acceleration related quantity is greater than or equal to the absolute value of the reference lateral acceleration related quantity;

wherein the reference lateral acceleration related quantity is a theoretical value of the lateral acceleration related quantity acting on the vehicle when the vehicle is turning in a state in which the steering-member operating amount and the vehicle-body speed are both constant, which theoretical value is calculated using a model of vehicle motion based on the steering-member operating amount and the vehicle-body speed; and

braking force control means for controlling a braking force applied to each of front and rear wheels of the vehicle so that the actual lateral acceleration related quantity approaches the target lateral acceleration related quantity.

4. (Original) A motion control apparatus for a vehicle according to claim 3, wherein the target lateral acceleration related quantity calculating means changes the amount by which the target lateral acceleration related quantity deviates from the reference lateral acceleration related quantity in accordance with the steering-member operating amount.

5. (Previously Presented) A motion control apparatus for a vehicle according to claim 3, wherein

the prescribed rule determines the reference lateral acceleration related quantity based on an actual specification value of the vehicle which influences the turning properties of the vehicle; and

the target lateral acceleration related quantity calculating means calculates, as the target lateral acceleration related quantity, the reference lateral acceleration related quantity determined in accordance with the prescribed rule and on the basis of a control specification value instead of the actual specification value, the control specification value being deviated from the actual specification value in accordance with the vehicle-body speed or the vehicle-body speed and the steering-member operating amount.

6. (Currently Amended) A motion control apparatus for a vehicle comprising:

vehicle-body speed obtaining means for obtaining a vehicle-body speed of the vehicle;

steering-member operating amount obtaining means for obtaining an operating amount of a steering member of the vehicle which changes a steering angle of steerable wheels of the vehicle;

actual lateral acceleration related quantity obtaining means for obtaining, as an actual lateral acceleration related quantity, an actual value of a lateral acceleration related quantity indicating the extent of turning of the vehicle;

target lateral acceleration related quantity calculating means for calculating a target lateral acceleration related quantity which is a target value of the lateral acceleration related quantity, in such a manner that

the absolute value of the target lateral acceleration related quantity is equal to or less than the absolute value of a reference lateral acceleration related quantity which is a reference value of the lateral acceleration related quantity determined by a prescribed rule based on at least the vehicle-body speed and the steering-member operating amount;

braking force control means for controlling a braking force applied to each of front and rear wheels of the vehicle so that the actual lateral acceleration related quantity approaches the target lateral acceleration related quantity; and

the target lateral acceleration related quantity calculating means is constructed to calculate the target lateral acceleration related quantity in such a manner that the absolute value of the target lateral acceleration related quantity does not exceed a target lateral acceleration related quantity limiting value, which is set in accordance with an actual specification value of the vehicle which influences the generated roll angle of the vehicle;

wherein the reference lateral acceleration related quantity is a theoretical value of the lateral acceleration related quantity acting on the vehicle when the vehicle is turning in a state in which the steering-member operating amount and the vehicle-body speed are both constant, which theoretical value is calculated using a model of vehicle motion based on the steering-member operating amount and the vehicle-body speed.

7. (Original) A motion control apparatus for a vehicle according to claim 6, wherein the target lateral acceleration related quantity calculating means is constructed such that the amount by which the target lateral acceleration related

quantity deviates from the reference lateral acceleration related quantity changes in accordance with the absolute value of the reference lateral acceleration related quantity.

8. (Canceled)

9. (Previously Presented) A motion control apparatus for a vehicle according to claim 6, further comprising:

road-surface friction coefficient obtaining means for obtaining a road-surface friction coefficient, which is the coefficient of friction between a road surface on which the vehicle travels and tires of the wheels of the vehicle; and

target lateral acceleration related quantity limiting means for setting a target lateral acceleration related quantity limiting value in accordance with the road-surface friction coefficient and for limiting the target lateral acceleration related quantity, when the absolute value of the target lateral acceleration related quantity is greater than the target lateral acceleration related quantity limiting value, in such a manner that the absolute value of the target lateral acceleration related quantity coincides with the target lateral acceleration related quantity limiting value.

10. (Previously Presented) A motion control apparatus for a vehicle according to claim 4, wherein

the prescribed rule determines the reference lateral acceleration related quantity based on an actual specification value of the vehicle which influences the turning properties of the vehicle; and

the target lateral acceleration related quantity calculating means calculates, as the target lateral acceleration related quantity, the reference lateral acceleration related quantity determined in accordance with the prescribed rule and on the basis of a control specification value instead of the actual specification value, the control specification value being deviated from the actual specification value in accordance with the vehicle-body speed or the vehicle-body speed and the steering-member operating amount.

11. (Previously Presented) A motion control apparatus for a vehicle according to claim 7, wherein the target lateral acceleration related quantity calculating means is constructed to calculate the target lateral acceleration related quantity in such a manner that the absolute value of the target lateral acceleration related quantity does not exceed a target lateral acceleration related quantity limiting value, which is set in accordance with an actual specification value of the vehicle which influences the generated roll angle of the vehicle.

12. (Previously Presented) A motion control apparatus for a vehicle according to claim 7, further comprising:

road-surface friction coefficient obtaining means for obtaining a road-surface friction coefficient, which is the coefficient of friction between a road surface on which the vehicle travels and tires of the wheels of the vehicle; and

target lateral acceleration related quantity limiting means for setting a target lateral acceleration related quantity limiting value in accordance with the road-surface friction coefficient and for limiting the target lateral acceleration related

quantity, when the absolute value of the target lateral acceleration related quantity is greater than the target lateral acceleration related quantity limiting value, in such a manner that the absolute value of the target lateral acceleration related quantity coincides with the target lateral acceleration related quantity limiting value.

13. (New) A motion control apparatus for a vehicle according to claim 3, wherein:

the lateral acceleration related quantity is yaw rate; and a reference yaw rate, as the reference lateral acceleration related quantity, is calculated according to the equation $Y_{rt} = (V_{so} \cdot \theta_s) / (n \cdot l) \cdot (1 / (1 + K_h \cdot V_{so}^2))$, wherein V_{so} is an estimated vehicle body speed, θ_s is a steering angle, n is a gear ratio, l is a wheel base, and K_h is a stability factor.

14. (New) A motion control apparatus for a vehicle according to claim 6, wherein:

the lateral acceleration related quantity is lateral acceleration; and a reference lateral acceleration, as the reference lateral acceleration related quantity, is calculated according to the equation $G_{ybase} = (V_{so}^2 \cdot \theta_s) / (n \cdot l) \cdot (1 / (1 + K_h \cdot V_{so}^2))$, wherein V_{so} is an estimated vehicle body speed, θ_s is a steering angle, n is a gear ratio, l is a wheel base, and K_h is a stability factor.